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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO.       |
|--|-------------|----------------------|-----------------------------|------------------------|
| 10/799,309   | 03/12/2004  | Toshihiko Watanabe   | 112857-467                  | 8209                   |
| 7590<br>William E. Vaughan<br>Bell, Boyd & Lloyd LLC<br>P.O. Box 1135<br>Chicago, IL 60609 |             | 05/11/2007           | EXAMINER<br>LOUIE, WAI SING |                        |
|  |             |                      | ART UNIT<br>2814            | PAPER NUMBER           |
|  |             |                      | MAIL DATE<br>05/11/2007     | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/799,309 | <b>Applicant(s)</b><br>WATANABE ET AL. |  |
|                              | <b>Examiner</b><br>Wai-Sing Louie    | <b>Art Unit</b><br>2814                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 3-14, 20-25, 35 and 37-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38 and 39 is/are allowed.
- 6) ☒ Claim(s) 3-14, 20-25, 35 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 9-11, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al. (US 6,147,451) in view of Udagawa (US Pub. 2002/0000563).

With regard to claims 3, 9-10, and 21, Shibata et al. disclose a light-emitting display device, (col. 3, line 50 et seq. and fig. 9) comprising:

- A light-emitting device 20 main body having a light output surface 23 and transferred (col. 7, lines 52-65);
- A transparent electrode 24 formed in a size larger than a size of the light output surface 23 so as to cover the light output surface 23 (col. 7, lines 9-17 and fig. 9);
- The light-emitting device main body is provided in the form of a chip 20 that includes a plurality of semiconductor layers (col. 1, lines 32-43), where the transparent electrode 24 is connected directly to a whole area of the light output surface (fig. 9);
- Shibata et al. do not disclose the transparent electrode 24 is connected to the light output surface through a contact metal layer. However, Udagawa discloses a LED

a contact metal layer 609 formed of Au (Udagawa paragraph [0086] and fig. 9).

Udagawa teaches the contact metal layer improves the current diffusion and improves the efficiency of light-emission (Udagawa paragraph [0012]).

Therefore, it would have been obvious at the time the invention was made to modify Shibata's device with the teaching of Udagawa to provide a contact metal layer in order to improve the current diffusion and improve the efficiency of light-emission. Shibata et al. disclose the size of the transparent electrode 24 covering the organic semiconductor light output surface 23 is much larger (minute relative) the contact layer (fig. 9).

With regard to claims 4 and 20, Shibata et al. disclose the transparent electrode 24 provides direct connection 3a between a wiring 5 (data line) for supplying electrical power to the light-emitting device main body 20 and where the wiring is formed outside the region of the light output surface (fig. 8-9).

With regard to claim 11, Shibata et al. disclose the transparent electrode 24 is formed collectively on the light surfaces of the plurality of light-emitting device main bodies 20 (fig. 8 and 9).

With regard to claims 22-23, Shibata et al. disclose the contact metal is gold, which is a noble metal (col. 1, line 27).

Claims 5, 14, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al. (US 6,147,451) modified by Udagawa (US Pub. 2002/0000563) as applied to claim 6 above, and further in view of Yoshitake et al. (US 6,900,473).

With regard to claim 5, Shibata et al. modified by Udagawa do not disclose the refractive index of the transparent electrode. However, Yoshitake et al. disclose the refractive index of the transparent electrode 17 (col. 7, lines 24-33) is lower than the refractive index of the semiconductor layer 13 including the light output surface (col. 8, line 33 and fig. 12) and is higher than the refractive index of a resin (col. 1, lines 31-32) provided on the upper side of the transparent electrode 17 (col. 3, lines 55-64). Yoshitake et al. teach the transparent electrode has a lower refractive index would reduce the internal reflection and has higher light output efficiency (Yoshitake col. 1, lines 28-39). Therefore, it would have been obvious to one of ordinary skill in the art to modify Shibata's device with the teaching of Udagawa and Yoshitake et al. to have a lower refractive index transparent electrode than the resin layer in order to reduce the internal reflection and have higher light output efficiency.

With regard to claims 14 and 35, in addition to the limitations disclosed in claims 3 and 4 above, Shibata et al. modified by Udagawa and Yoshitake et al. disclose an image display apparatus comprising:

- An image display surface formed by arranging a plurality of light-emitting device 120 on an apparatus substrate 100, each of the light-emitting device 120 comprising a light-emitting device main body 110 having a light output surface and transferred (TFT 101), and a transparent electrode 111 is formed in a size larger than a size of the light output surface so as to cover the light output surface and connected to whole area of the light output surface through a contact layer, where a size of the contact layer is less than the size of the light output surface (Shibata fig. 10).

- A contact metal 23 formed on the light output surface, where the size of the contact metal is less than a size of the light output surface (Yoshitake fig. 1b).

Claims 6-8, 12-13, 24-25, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al. (US 6,147,451) modified by Udagawa (US Pub. 2002/0000563) as applied to claim 6 above, and further in view of Yashiki (US 5,454,716).

With regard to claims 6 and 12, Shibata et al. do not disclose coating the light output surface with a conductive paste containing conductive particles dispersed in a light transmitting resin forms the transparent electrode. However, Yashiki discloses forming a conductive layer by coating the substrate with a layer of heat-cured resin embedded with conductive material such as metal particles (Yashiki col. 6, lines 32-36). Yashiki teaches the heat-cured conductive resin layer is stable; improves adhesion property to the device; and improves the image quality (Yashiki col. 6, lines 40-56). Therefore, it would have been obvious to one of ordinary skill in the art to modify Yoshitake's device with the teaching of Udagawa and Yashiki to provide a coating on the light output surface with a conductive layer containing conductive particles dispersed in a light transmitting resin in order produce stable; improves adhesion property to the device; and improves the image quality.

With regard to claims 7 and 13, Shibata et al. modified by Yashiki disclose the conductive particles scatter light emitted from the light output surface and diffuse the light from the transparent electrode (conductive layer) to an exterior of the device (Yashiki col. 6, lines 57-60).

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With regard to claim 8, Shibata et al. modified by Yashiki disclose the conductive particles include ITO (col. 6, line 35 and col. 19 and line 17).

With regard to claims 24-25, Shibata et al. modified by Yashiki disclose the protective resin layer and a diffusion-preventing layer formed to cover the transparent electrode (conductive layer) to an exterior of the device (Yashiki col. 6, lines 40-56).

With regard to claim 37, Shibata et al. modified by Udagawa disclose a resin 84 formed on the upper side of the transparent electrode 606 (Udagawa fig. 9 and 10).

***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or suggest either in singularly or in combination the following limitations and other elements in the claims.

References Shibata et al. do not disclose:

- A transparent electrode formed in a size larger than a size of the light output surface so as to cover the light output surface, where the LED main body is fixed to an insulation resin layer, where a portion of the LED main body protrudes from the insulation resin layer so as to generate a step between a surface of the insulation resin layer and the light output surface.

Reference Udagawa does not disclose:

- The LED main body is fixed to an insulation resin layer, where a portion of the LED main body protrudes from the insulation resin layer so as to generate a step between a surface of the insulation resin layer and the light output surface.

Reference Yashiki does not disclose:

- The LED main body is fixed to an insulation resin layer.

Therefore, the above references do not disclose the claimed invention of present application and claims 38-39 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

Applicant's arguments filed 2/27/2007 have been fully considered but they are not persuasive.

- Applicant's arguments are directed to the reference Jackson et al., which is no longer used in the present rejection, and therefore, with respect to claims 3-14, 20-25, 35, and 37 have been considered but are moot in view of the new ground(s) of rejection.
- Claims 38-39 are new claims, which are allowed as listed above.



*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

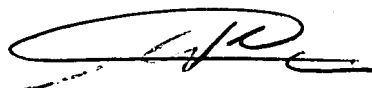
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**WAI-SING LOUIE**  
**PRIMARY PATENT EXAMINER**

Wsl  
May 7, 2007.